

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Assistant Secretary for Housing-Federal Housing Commissioner TO: DIRECTORS, HOUSING DIVISION DIRECTORS, MULTIFAMILY DIVISION DIRECTORS, SINGLE FAMILY DIVISION	Series and Series Number: (Supersedes issue dated February 8, 1994) MATERIALS RELEASE NO. 925g ISSUE DATE: February 25, 1998 REVIEW DATE: February 25, 2001
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SUBJECT: 1. Product Microllam Laminated Veneer Lumber

2. Name and Address Trus Joist MacMillan, A Limited Partnership
 of Manufacturer 200 E. Mallard Drive
 Boise, ID 83707

Data on the nonstandard product, described herein have been reviewed by the Department of Housing and Urban Development (HUD) and determination has been made that it is considered suitable from a technical standpoint for the use indicated herein. This Release does not purport to establish a comparative quality or value rating for this product as compared to standard products normally used in the same manner.

This Materials Release cannot be used as an indication of endorsement, or approval by HUD of the described product, and any statement or representation, however made, indicating such approval or endorsement by HUD is unauthorized. See Code 18, U.S.C. 709.

Any reproduction of this Release must be in its entirety.

USE: General framing lumber.

DESCRIPTION:

Microllam laminated veneer lumber is lumber manufactured by laminating Douglas Fir (DF), Lodgepole Pine (LP), Western Hemlock (WH), Yellow Poplar (YP) or Southern Pine (SP) in a continuous press with all the veneer grains paralalled to the length of the member. DF, LP and WH may be combined as Eastern Species (ES). Microllam is available in thicknesses from 3/4" to 3 1/2", depths from 2 1/2" to 48" and lengths up to 80'.

The veneers are bonded by spreading an exterior type adhesive (phenol-formaldehyde) on one side and feeding them into a press in the desired lay-up pattern. The press compresses the material to the required thickness with heat and pressure applied throughout the length of the press. The material moves through the press at a constant rate determined by the curing time required for a given thickness.

REQUIREMENTS:

Microllam laminated veneer lumber shall meet all requirements of this Materials Release (MR).

1. Manufacturing Tolerance:

A manufacturing tolerance of plus or minus 1/8" shall be allowed for specified length, plus or minus 1/16" for specified width, plus or minus 1/32" for specified thickness.

2. Glue:

Glue shall be a phenol-formaldehyde type resin meeting ASTM D 2559 and shall have minimum solids content of 40 percent. The option to use a melamine adhesive on the face laps is allowed.

3. Veneers:

Veneers vary in thickness, are 27" or 54" wide, 101" long, and end joined with a lap splice, butt joint or scarf joint.

4. Physical Properties:

Density	32 pcf (average)
Moisture Content	12% max. (at delivery)

DESIGN AND ALLOWABLE STRESSES:

The structural performance quality of the finished member is assured by sampling and testing in accordance with the Trus Joist MacMillan quality control performance procedures. The design practices for solid sawn lumber apply to Microllam laminated veneer lumber. The design stresses of Table No. 1 are for dry conditions of use where the average moisture content of sawn lumber will not exceed 16%.

Lateral nail holding and withdrawal values shall be as provided in the National Design Specification for Wood Construction (NDS) for Douglas Fir sawn lumber. Holding power of bolts shall be as provided in NDS for Douglas Fir. These values are subject to adjustment for duration of load.

TABLE 1- Microllam LVL Framing Lumber Design Stresses (1) (8)
(pounds per square inch)

Billet Material Thickness	Grade Species (2)	Axial		Joist/Beam				Plank		
				MOE				F _b	F _v	F _c L (7)
				F _t (3)	F _c	F _b (4) (5)	F _v (6)	(x10 ⁶)	F _c L (7)	
3/4 inch to 1-3/4 inch	1.6	DF/LP/WH		1240	1995	2140	285	1.6	750	2530 190 480
	1.8	DF/LP/WH		1450	2260	2445	285	1.8	750	2890 190 480
	1.9	DF/LP/WH		1555	2385	2600	285	1.9	750	3075 190 480
	2.0	DF/LP/WH		1660	2500	2750	285	2.0	750	3255 190 480
	2.2	DF/LP/WH		1865	2725	3060	285	2.2	750	3615 190 480
	2.4	DF/LP/WH		2075	2925	3365	285	2.4	750	3980 190 480
	2.6	DF/LP/WH		2285	3110	3675	285	2.6	750	4345 190 480
1-7/8 inch to 3-1/2 inch	1.6	DF/LP/WH		1240	1995	1930	285	1.6	750	2285 190 480
	1.8	DF/LP/WH		1450	2260	2210	285	1.8	750	2610 190 480
	1.9	DF/LP/WH		1555	2385	2345	285	1.9	750	2775 190 480
	2.0	DF/LP/WH		1660	2500	2485	285	2.0	750	2940 190 480
	2.2	DF/LP/WH		1865	2725	2765	285	2.2	750	3265 190 480
	2.4	DF/LP/WH		2075	2925	3040	285	2.4	750	3595 190 480
	2.6	DF/LP/WH		2285	3110	3315	285	2.6	750	3920 190 480
3/4 inch to 3-1/2 inch	1.8	SP		1575	2735	2445	285	1.8	880	2890 190 525
	1.9	SP		1690	2885	2600	285	1.9	880	3075 190 525
	2.0	SP		1805	3030	2750	285	2.0	880	3255 190 525
	2.2	SP		2030	3300	3060	285	2.2	880	3615 190 525
	2.4	SP		2260	3545	3365	285	2.4	880	3980 190 525
	2.6	SP		2485	3765	3675	285	2.6	880	4345 190 525
3/4 inch to 3-1/2 inch	1.6	YP		1350	2410	2140	285	1.6	880	2530 190 670
	1.8	YP		1575	2735	2445	285	1.8	880	2890 190 670
	1.9	YP		1690	2885	2600	285	1.9	880	3075 190 670
	2.0	YP		1805	3030	2750	285	2.0	880	3255 190 670
	2.2	YP		2030	3300	3060	285	2.2	880	3615 190 670
3/4 inch to 1-3/4 inch	2.0E - 2925Fb	SP		1805	3030	2925	285	2.0	880	3455 190 525

- (1) Tabulated design values contain adjustments for a range of common application conditions. When used in specific applications, values shall be subject to the adjustments outlined below.
- (2) DF = Douglas fir; LP = lodgepole pine; WH = western hemlock; SP = southern pine; YP = yellow poplar. DF, WH and LP are permitted to be combined as Western Species (WS). SP and YP are permitted to be combined as Eastern Species (ES). When using the species group designation ES or WS, the allowable stresses shall be the lower values for the species in the group.
- (3) The F_t values in the table reflect the volume effects of length, width and thickness.
- (4) F_b includes allowances for variations in span to depth ratio and method of loading and shall be used without further adjustment except as noted below. For engineered uses where the responsible engineer or architect provides signed calculations, F_b is permitted to be increased five percent.
- For depths other than 12 inches, regardless of thickness, table values shall be multiplied by $(12/d)^{0.136}$. Adjustments for common depths are:

Depth	3.5	5.5	7.25	9.25	12	16	20	24
Multiplier	1.18	1.11	1.07	1.04	1.00	0.96	0.93	0.91

- (5) When structural members qualify as repetitive members in accordance with the building code, a four percent increase is permitted. This increase is permitted in addition to that permitted by Footnote 4. The increase does not apply to multi-member beams field assembled.
- (6) For simplicity, use 285 psi for depths up to 24 inches and 260 psi for depths greater than 24 inches. When a more accurate analysis is desired, the allowable horizontal shear for all depths greater than 12 inches is $F_v = 285 (12/d)^{0.065}$.
- (7) F_{CL} shall not be increased for duration of load for beams, SC Beams, and Billet Beams.
- (8) Deflection shall be calculated as follows:

$$\Delta = \frac{270WL^4}{Ebd^3} + \frac{28.8WL^2}{Ebd}$$

where:

W = Uniform load, plf
 Δ = Deflection, inches
L = Span, feet

b = Beam width, inches
d = Beam depth, inches
E = Modulus of Elasticity, psi

INSTALLATION AND LIMITATIONS:

Installation shall be in strict accordance with HUD Minimum Property Standards (MPS) as set forth in 24 CFR 200.929, and local codes for solid lumber construction, with the following limitations:

1. Nails installed parallel to the glue lines on the narrow face of material at least 3/4" in width and 2 1/2" in depth shall be spaced a minimum of 4" for 10 penny common nails on 14 gauge staples and 3" for 8 penny common nails. Sixteen penny common nails installed parallel to the glue lines on the narrow face of material at least 1 1/2" in width and 3 1/2" in depth shall be spaced a minimum of 8". Nails installed perpendicular to the glue lines on the wide face may be installed in accordance with NDS.
2. Microllam laminated veneer lumber shall be stored and handled in accordance with established recommendations for plywood.

CERTIFICATION AND IDENTIFICATION:

Trus Joist MacMillan shall certify that the Microllam laminated veneer lumber conforms to the requirements of this MR. PFS Corporation shall validate the manufacturer's certification that the Microllam lumber meets the requirements of this MR. The quality control test records shall be made available for inspection by HUD inspection upon request.

Each member certified as conforming to this MR shall be marked with the following information:

- a. Microllam LVL.
- b. Manufacturer's name or logo.
- c. Registered logo of PFS.
- d. Species or species group.
- e. HUD MR 925g.
- f. Mill number.



Microllam.
Trus Joist MacMillan

1.8E ES LVL

NER-481
HUD 925
CCMC 08675-R



96-11-01-1

WARRANTY:

Trus Joist MacMillan warrants Microllam laminated veneer lumber to be free of any defects due to faulty materials and workmanship in the manufacturing process for a period of twenty (20) years from the date of installation. The liability of Trus Joist MacMillan under this warranty shall be limited to replacement of defective materials and the cost of installation or at the option of Trus Joist MacMillan payment in lieu thereof.

This warranty applies to any material failure due to the manufacturing only and does not cover nor will the manufacturer be liable for any defects or damages due to misuse, improper installation, or damage resulting from fire, lightning or other causes beyond the manufacturer's control.

This manufacturer's warranty does not relieve the builder, in any way, of responsibility under the terms of the Builder's Warranty required by the National Housing Act, or under any provisions applicable to any other programs. A copy of the manufacturer's warranty shall be furnished by the builder to the homeowner.

MANUFACTURER'S RESPONSIBILITIES:

Issuance of this Materials Release (MR) commits the manufacturer to fulfill, as a minimum, the following:

1. Produce, label and certify the material, product or system in strict accordance with the terms of this MR.
2. Provide necessary corrective action in a timely manner for all cases of justified complaint, poor performance or failure reported by HUD.
3. When requested, provide the Office of Consumer and Regulatory Affairs, HUD Headquarters, with a representative list of properties, in which the material, product or system has been used, including complete addresses or descriptions of locations and dates of installation.
4. Inform HUD in advance of changes in production facilities, methods, design of the product, company name, ownership or mailing address.

EVALUATION:

This MR shall be valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this MR shall apply for a renewal or revision 90 days prior to the Review Date printed on this MR. Submittals for renewal or revision shall be sent to HUD Headquarters. Appropriate user fee shall be sent to:

U.S. Department of Housing and Urban Development
Technical Suitability of Products Fees
P.O. Box 954199
St. Louis, MO 63195-4199

The holder of this MR may apply for revision at any time prior to the Review Date. Minor revisions may be in the form of a supplement to the MR.

If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate User Fee for a revision will need to be submitted in accordance with Code of Federal Regulations 24 CFR 200.934, "User Fee System for the Technical Suitability of Products Program," and current User Fee Schedule.

CANCELLATION:

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the MR. HUD will notify the manufacturer that the MR may be canceled when:

1. conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of the accepted material, product, or system,
2. the manufacturer has changed its organizational form without notifying HUD, or
3. the manufacturer has not complied with responsibilities it assumed as a condition of HUD's acceptance.

However, before cancellation, HUD will give the manufacturer a written notice, of the specific reasons for cancellation, and the opportunity to present views on why the MR should not be canceled. No refund of fees will be made on a canceled document.

This Materials Release is issued solely for the captioned firm, and is not transferable to any person or successor entity.
